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THE GENUS LASIOSPHAERIA

FRED J. SEAVER

(WITH PLATES 66 AND 67, CONTAINING 37 FIGURES)

In working over the Trichosphaeriaceae preparatory to a monograph of the family a number of points of interest have arisen relating both to genera and species. In order to bring out some of these points the North American species of the genus *Lasiosphaeria* are here described and illustrated.

The genus *Lasiosphaeria* was founded in 1863 by Cesati and De-Notaris, with *Sphaeria ovina* Pers. as type of the genus. In 1869 Fuckel took up the genus *Leptospora* Rabenh. but used it in a different sense from that in which it was originally used by Rabenhorst,¹ including *Sphaeria ovina* Pers. in this genus. In the diagnosis of the genus *Leptospora* Fuckel states: "Diese Gattung steht, was den Sporenbau anbelangt, *Lasiosphaeria* nahe, nur sind bei *Leptospora* die Sporen ohne Querwänden." In the members of this group of plants it is very difficult to rely upon the septation of the spores as a basis for generic distinction since in many species the spores are nonseptate when young and it is difficult to find mature spores, but when mature spores are found, they are often delicately separate. The type of the genus *Lasiosphaeria* as usually collected has nonseptate vermiform spores while rarely plants of the same species are found with some of the spores enlarged at one end into an ellipsoid head and becoming one or more septate. Other species of the genus which usually contain nonseptate spores occasionally have the spores septate without enlargement, the number of septa varying with the species. While Fuckel in his diagnosis of the genus *Leptospora* regards the spores as nonseptate he includes in the genus species in which, as described above, the spores are often septate. The genus *Leptospora* of Fuckel is therefore regarded as a synonym of *Lasiosphaeria*, in which genus the presence or absence of septa is a variable character.

¹ Hedwigia I: 116. 1857.

Since the genus *Lasiosphaeria* was founded numerous species have been placed in the genus which more properly belong with other genera of the Trichosphaeriaceae. The genus, therefore, as here treated is used in a somewhat restricted sense to include the species which, in the judgment of the writer, properly belong here. While as a rule the members of the genus have hairy perithecia in a few the perithecia are not conspicuously hairy at least when old. The delicate walled, long and usually vermiform spores constitute one of the most valuable diagnostic characters of the genus.

So far as the form and variability of the spores is concerned this group shows a very close relationship with the Fimetariaceae (Sordariaceae), the chief difference being in the consistency of the perithecia which may be due in part at least to the difference in substratum. Referring to *Pleurage albicans*, Griffiths² says: "A very interesting species from the fact that mature spores are seldom met with. . . . Often one may find asci in which the spores are slightly enlarged at the end, but it is seldom that they can be found in even the olive-green stage. In the vast majority of cases they are simply the long cylindrical curved guttulate structures that are the forerunners of the spores of so many of the species of the genus." The same statement will apply equally well to several species of the genus *Lasiosphaeria* as shown by the illustrations accompanying the present paper. While *Pleurage lutea* (Ellis & Ev.) Kuntze which occurs on wood is commonly placed with the Fimetariaceae it is doubtful whether it should not more properly have been placed in the genus *Lasiosphaeria* with the family Trichosphaeriaceae. As a whole the present genus shows a rather close relationship with the genus *Pleurage* of the Fimetariaceae.

As the present paper is preliminary to a treatment of the family Trichosphaeriaceae in North American Flora, any data regarding additional species in the genus *Lasiosphaeria* or notes regarding the extension of range of distribution of any of the species here described will be very gladly received.

² North American Sordariaceae. Mem. Torrey Club 11: 80. 1901.

LASIOSPHAERIA Ces. & De-Not. Comm. Soc. Critt.

Ital. 1: 229. 1863

Leptospora Fuckel, Symb. Myc. 143. 1869. ?Not *Leptospora* Rabenh. 1857.

Perithecia superficial, free or seated in a subiculum consisting of a black or dark brown mycelial growth, cylindric, globose, ovoid or pyriform, brownish or blackish or occasionally light colored by reason of the pale hairs with which they are clothed, or clothed with black hairs; hairs rigid or flexuous, few or abundant; asci cylindric or clavate, usually 8-spored; spores very variable, usually vermiform with a delicate appendage at either end, hyaline or colored a part of their length, or often with an enlarged head which may be hyaline or dark brown in color, simple at first but often becoming at maturity delicately septate; septa variable in number or in some species constant.

Type species, *Sphaeria ovina*.

Spores uniformly hyaline or subhyaline throughout their entire length.

Perithecia clothed with light colored hairs giving them a grayish or yellowish appearance.

Hairs scant, flexuous, varying from yellowish to whitish.

Hairs abundant, rigid, giving the perithecia a spiny appearance.

Neck of the perithecia simple.

Neck of perithecia compound, four-parted.

Perithecia clothed with black hairs.

Perithecia subglobose to pyriform.

Hairs abundant, rigid, giving the perithecia a spiny appearance.

Spores 50-80 \times 6 μ , becoming 7-septate.

Plants occurring on wood.

Plants occurring on soil.

Spores 65-70 \times 3-4 μ , becoming many-septate.

Hairs scant, spores small, 20 \times 4 μ .

Perithecia flat below, depressed-conic.

Spores dark brown a part of their length.

Colored portion of spore enlarged into an ellipsoid head.

Colored portion of spore not enlarged.

1. *L. mucida*.

2. *L. strigosa*.

3. *L. stuppea*.

4. *L. hispida*.

5. *L. terrestris*.

6. *L. multiseptata*.

7. *L. globularis*.

8. *L. jamaicensis*.

9. *L. newfieldiana*.

10. *L. dichroöspora*.

1. *Lasiosphaeria mucida* (Tode)

Sphaeria mucida Tode, Fungi Meckl. 2: 16. 1791.

Sphaeria mutabilis Pers. Ic. Descr. Fung. 24. 1798.

Sphaeria ovina Pers. Syn. 71. 1801.

Leptospora ovina Fuckel, Symb. Myc. 143. 1869.

Lasiosphaeria ovina Ces. & De-Not. Comm. Soc. Critt. Ital. 1: 229. 1863.

Perithecia superficial, gregarious or often crowded, nearly globose with a more or less prominent ostiolum, about .5 mm. in diameter, clothed externally with a fine white or yellowish tomentum except the ostiolum which appears as a black dot, the entire perithecium becoming darker with age, at length brownish or blackish, hard and carbonaceous; asci cylindric or clavate, 8-spored, surrounded by a yellow mucilaginous substance, $150-200 \times 15-20 \mu$; spores cylindric, or vermiform, usually abruptly curved near the lower end, hyaline, simple or indistinctly septate or pseudoseptate, often with a delicate appendage at either end and occasionally with one end swollen forming a conspicuous head, $35-50 \times 3-5 \mu$ (pl. 2, f. 1-3).

On rotten wood.

TYPE LOCALITY: Mecklenburg, Germany.

DISTRIBUTION: Maine to Colorado, Florida and Louisiana.

ILLUSTRATIONS: Tode, Fung. Meckl. pl. 10, f. 82; Pers. Ic. Descr. pl. 7, f. 6.

EXSICCATI: Ellis, N. Am. Fungi 892.

2. *LASIOSPHAERIA STRIGOSA* (Albert. & Schw.) Sacc.

Syll. Fung. 2: 201. 1883

?*Sphaeria canescens* Pers. Obs. Myc. 8: 67. 1796.

Sphaeria strigosa Albert. & Schw. Consp. Fung. 37. 1805.

Leptospora strigosa Fuckel, Symb. Myc. 144. 1869.

?*Lasiosphaeria canescens* Karst. Myc. Fenn. 2: 162. 1873.

?*Sphaeria sublanosa* Cooke; Cooke & Ellis, Grevillea 7: 41. 1878.

?*Metasphaeria sublanosa* Sacc. Syll. Fung. 2: 165. 1883.

Lasiosphaeria Hystrix Ellis & Ev. Proc. Acad. Nat. Sci. Phil. 1894: 326. (1895?)

Perithecia thickly gregarious and occasionally crowded, subglobose to ovoid, black, clothed externally with stout rigid yellowish hairs; hairs acute or subacute, $12-14 \mu$ in diameter near the

base with a narrow cavity extending longitudinally through the center, pale yellow with the microscope; asci clavate, 8-spored, about $100 \times 15-18 \mu$; spores 2-seriate or irregularly crowded, cylindric or cymbiform with acute ends, hyaline or pale yellowish, $25-30 \times 5-6 \mu$, granular within and often pseudoseptate near the center (*pl. I, f. 4-7*).

On rotten wood.

TYPE LOCALITY: Europe.

DISTRIBUTION: New Jersey to Ontario and Ohio.

ILLUSTRATIONS: Albert. & Schw. Consp. *pl. 5, f. 7*; Berl. Ic. Fung. **1**: *pl. 107, f. 2*.

3. LASIOSPHERIA STUPPEA Ellis. & Ev. Bull. Washburn Lab. Nat. Hist. **1**: 4. 1884

Perithecia superficial, gregarious, ovoid, about 1 mm. in diameter, densely clothed with light brown hairs; hairs simple, flexuous, blunt, with small central cavity, pale yellowish with transmitted light, $200-400 \mu$ long and about 6μ in diameter; ostiolum strongly 4-ribbed giving the appearance of a cluster of four perithecia imbedded in a stroma; asci clavate, 8-spored, $18-20 \mu$ in diameter and about 200μ long; spores partially 2-seriate, elongate-ellipsoid, $30-38 \times 8-10 \mu$, hyaline or slightly yellowish at maturity, with 1-3 oil-drops (*pl. I, f. 8-11*).

On dead wood of *Tsuga Pattoniana*.

TYPE LOCALITY: Mt. Paddo, Washington.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Ellis & Ev. N. Am. Pyrenom. *pl. 19, f. 5-10*.

4. LASIOSPHAERIA HISPIDA (Tode) Fuckel, Symb. Myc. **147**. 1869

Sphaeria hispida Tode, Fungi Meckl. **2**: 17. 1791.

Sphaeria Rhacodium Pers. Syn. Fung. 74. 1801.

Sphaeria hirsuta Pers. Ann. Bot. Usteri **11**: 24. 1794.

Sphaeria emergens Schw. Trans. Am. Phil. Soc. **II**: 4: 212. 1832.

Lasiosphaeria hirsuta Ces. & De-Not. Comm. Soc. Critt. Ital. **1**: 229. 1863.

Lasiosphaeria Rhacodium Ces. & De-Not. Comm. Soc. Critt. Ital. **1**: 229. 1863.

? *Sphaeria orthotricha* Berk. & Curt. Grevillea **4**: 108. 1876.

Perithecia gregarious, seated on a more or less well developed subiculum consisting of a black mycelial growth, ovate to pyriform, black, roughened and abundantly clothed with hairs; hairs black to the unaided eye, very dark brown with the microscope, long and flexuose near the base and shorter and more or less rigid above, blunt or subacute, simple or sparingly septate, the shorter hairs about $50-80\mu$ in length and 6μ in diameter, quite variable in length; substance of the perithecium tough, black and opaque; asci cylindric or clavate, 8-spored; spores 2-seriate or irregularly crowded, long vermiform, often abruptly curved near one end, hyaline, becoming pale brown with 8-10 large distinct oil-drops, for a long time simple, finally becoming delicately 6-7-septate, usually with one septum between each two oil-drops, $50-80 \times 6-8\mu$ (*pl. 2, f. 1-7*).

On rotten wood.

TYPE LOCALITY: Mecklenburg, Germany.

DISTRIBUTION: New York to Montana, Colorado and Alabama.

ILLUSTRATIONS: Tode, *Fungi Meckl. 2: pl. 10, f. 84*; Rabenh. *Krypt. Fl. 1¹: 194, f. 1-3*.

EXSICCATI: Ellis, *N. Am. Fungi 893*; Ellis & Ev. *Fungi Columb. 116, 3314*; Shear, *N. Y. Fungi 359*.

5. *LASIOSPHAERIA TERRESTRIS* (Sow.) de Thüm. Myc.

Univ. 1744. 1881

Sphaeria terrestris Sow. *Brit. Fungi pl. 373, f. 7*.

Perithecia scattered or gregarious, black or brownish black, nearly globose, about .5 mm. in diameter, clothed externally with a rather dense covering of rigid black hairs; hairs $7-8\mu$ in diameter at the base, rather blunt and about 200μ long; asci clavate, 8-spored; spores vermiform, crowded in the ascus, $65-70 \times 6\mu$, hyaline, multiguttulate, often with the end enlarged, becoming pale brownish at maturity and with several delicate septa (*pl. 2, f. 10-12*).

On soil.

TYPE LOCALITY: Great Britain.

DISTRIBUTION: Ohio; also in Europe.

ILLUSTRATION: Sow. *Brit. Fungi pl. 373, f. 7*.

6. *Lasiosphaeria multiseptata* Earle sp. nov.

Perithecia as in *Lasiosphaeria hispida*; spores long vermiform, slender, at first with numerous oil-drops, later becoming (many-

septate?), occasionally with one end of the spore enlarged forming a conspicuous head, $60-70 \times 3-4 \mu$ (*pl. 2, f. 8-9*).

Type collected on rotten wood of *Hicoria* at Tuskegee, Alabama, July 29, 1897, G. W. Carver 313 (herb. N. Y. Bot. Garden).

DISTRIBUTION: Alabama and Carolina.

EXSICCATI: Rav. Fungi Car. Exsicc. 5: 66 (as *Sphaeria Rhacodium*).

The material from which the above species is described was labeled "sp. nov." in the herbarium of the New York Botanical Garden, and while closely related to *Lasiosphaeria hispida* seems to differ in the more slender spores which are multiguttulate and finally (many-septate ?) with the upper end occasionally enlarged into a conspicuous head.

In looking over the specimens under the name of *Lasiosphaeria hispida* several were found which agree with the one described here. Whether the enlargement of the end of the spore is a variable character as has already been noted in *Lasiosphaeria mucida*, I am unable to determine, but it is possible that this may be found to be the case.

7. *Lasiosphaeria globularis* (Batsch)

Sphaeria globularis Batsch, Elench. Fung. Cont. 1: 271. 1786.

Sphaeria spermoides Hoffm. Veg. Crypt. 2: 12. 1790.

Lasiosphaeria spermoides Ces. & De-Not. Comm. Soc. Crit. Ital. 1: 229. 1863.

Leptospora spermoides Fuckel, Symb. Myc. 143. 1869.

? *Hypoxylon miliaceum* Bull. Herb. Fr. *pl. 444*.

Perithecia sessile, usually thickly crowded forming a compact mass somewhat resembling a *Hypoxylon*, often several cm. in diameter, at first cylindric, becoming subglobose, often so closely crowded as to become irregular in form from mutual pressure, black, 1 mm. high and .5 to 1 mm. in diameter, ostiolum only slightly prominent, slightly hairy becoming naked with age and minutely rough, very hard and carbonaceous; asci cylindric, 8-spored; spores cylindric, slightly curved, $20-27 \times 4 \mu$, hyaline (*pl. 1, f. 16-18*).

On old wood.

TYPE LOCALITY: Germany.

DISTRIBUTION: Newfoundland to New York.

ILLUSTRATIONS: Batsch, Elench. Fung. l. c. *pl.* 30, *f.* 180; Rabenh. Krypt. Fl. 1²: 195, *f.* 1-3; Engler-Prantl, Nat. Pfl. 1¹: 397, *f.* 256, A-B.

8. *Lasiosphaeria jamaicensis* sp. nov.

Perithecia thickly gregarious, depressed, subconic, flattened below so as to appear to be partially immersed in the substratum but in reality entirely superficial, when removed leaving a ring-like scar 1 mm. across, the diameter of the base of the perithecium, ostium large, circular and rather prominent, the entire perithecium covered with a brownish floccose coat or entirely black, sparingly clothed with delicate erect bristles which also occur on the substratum surrounding the perithecia; hairs very dark brown or blackish, septate, rather blunt, 10-12 μ in diameter at the base; asci clavate, 8-spored; spores vermiform with blunt ends, abruptly bent near the center, 8-guttulate, becoming 7-septate, subhyaline or slightly yellowish, 50-60 \times 7 μ ; paraphyses numerous and filiform (*pl.* 1, *f.* 1-3).

Type collected on the stem of some unknown plant (probably a palm) at Castle Gardens, Jamaica, December 14-15, 1908, by W. A. and Edna L. Murrill, 127 (herb. N. Y. Bot. Garden).

DISTRIBUTION: West Indies.

9. *LASIOSPHAERIA NEWFIELDIANA* Ellis & Ev. N. Am.

Pyrenom. 150. 1892

?*Lasiosphaeria ambigua* Sacc. Michelia 1: 46. 1879.

Perithecia gregarious, superficial, at first depressed, becoming ovoid or subconic, about .5 mm. broad and as large as 1 mm. in height, clothed with soft brown hairs and seated on a dense brown mycelial growth consisting of the same kind of hairs; hairs brown, septate, about 4 μ in diameter; asci cylindric, 8-spored; spores vermiform, at first hyaline, 35 \times 4 μ , with a short apiculus at each end, the upper end finally enlarged into an ellipsoid, brown head; at maturity the spore consisting of the brown head 15-17 \times 6-7 μ with a cylindric hyaline appendage 3 \times 20 μ at the base, and a slightly shorter, much more slender appendage, 1-2 μ in diameter at the apex (*pl.* 1, *f.* 12-15).

On rotten wood.

TYPE LOCALITY: Newfield, New Jersey.

DISTRIBUTION: New Jersey to Ohio.

10. LASIOSPHAERIA DICHROÖSPORA Ellis & Ev. Erythea

1: 197. 1893

Perithecia densely gregarious, ovoid, rugose, black, tough-membranaceous, clothed with a few slender brown hairs; ostium broad convex-papilliform, sometimes subcompressed; asci lanceolate, $150 \times 8-10 \mu$, 8-spored; spores 2-seriate, cylindric, bent near the lower end and hyaline below for about one third the length of the spore, abruptly black above, each end mucronately pointed, about $40-60 \times 4-6 \mu$ (*pl. 2, f. 13-15*).

On clay loam in woods.

TYPE LOCALITY: Seattle, Washington.

DISTRIBUTION: Known only from the type locality.

EXCLUDED SPECIES

Lasiosphaeria striata Ellis & Ev. Proc. Acad. Nat. Sci. Phil. 1893: 443. This species was described from material collected on willow limbs near Park Hill, Ontario, Canada, May 1893 by J. Dearness. The plant is a discomycete belonging to the genus *Godronia* and is apparently identical with *Godronia Betheli* Seaver which was described from material collected on branches of willow in the Rocky Mountains of Colorado. The small cups are constricted at their mouths and when dry collapse so as to give the appearance of perithecia which probably accounts for the fact that they were placed in the genus *Lasiosphaeria* by Ellis. The species would then be *Godronia striata* (Ellis & Ev.) Seaver with *Godronia Betheli* Seaver as a synonym.

EXPLANATION OF PLATE LXVI

Spores and asci drawn with camera lucida to a common scale.

Figs. 1-3. *Lasiosphaeria jamaicensis* Seaver. 1. Perithecia about natural size. 2. Perithecia enlarged. 3. Ascus and spores.

Figs. 4-7. *Lasiosphaeria strigosa* (Albert. & Schw.) Sacc. 4. Perithecia about natural size. 5. Perithecia enlarged. 6. Ascus with spores.

Figs. 8-11. *Lasiosphaeria stuppea* Ellis & Ev. 8. Perithecia about natural size. 9. Perithecia enlarged. 10. Ascus with spores. 11. Hair from perithecium.

Figs. 12-15. *Lasiosphaeria newfieldiana* Ellis & Ev. 12. Perithecia about natural size. 13. Perithecia enlarged. 14. Ascus with immature spores. 15. Ascus with mature spores.

Figs. 16-18. *Lasiosphaeria globularis* (Batsch) Seaver. 16. Perithecia about natural size. 17. Perithecia enlarged. 18. Ascus with spores.

EXPLANATION OF PLATE LXVII

Spores and asci drawn with camera lucida to a common scale.

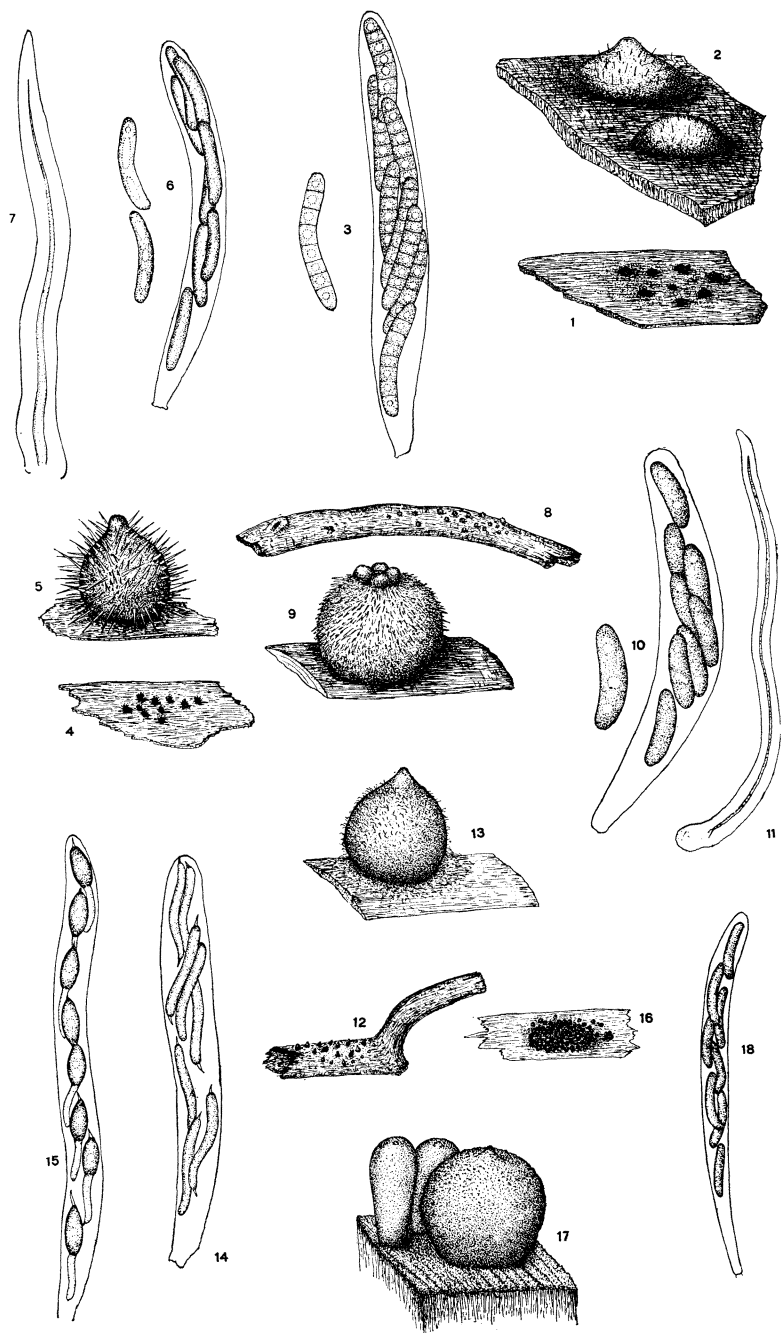
Figs. 1-7. *Lasiosphaeria hispida* (Tode) Fuckel. 1. Perithecia about natural size. 2. Hair from base of perithecium. 3 and 4. Perithecia enlarged. 5. Ascus with spores. 6. Spore showing septa. 7. Hairs from perithecia.

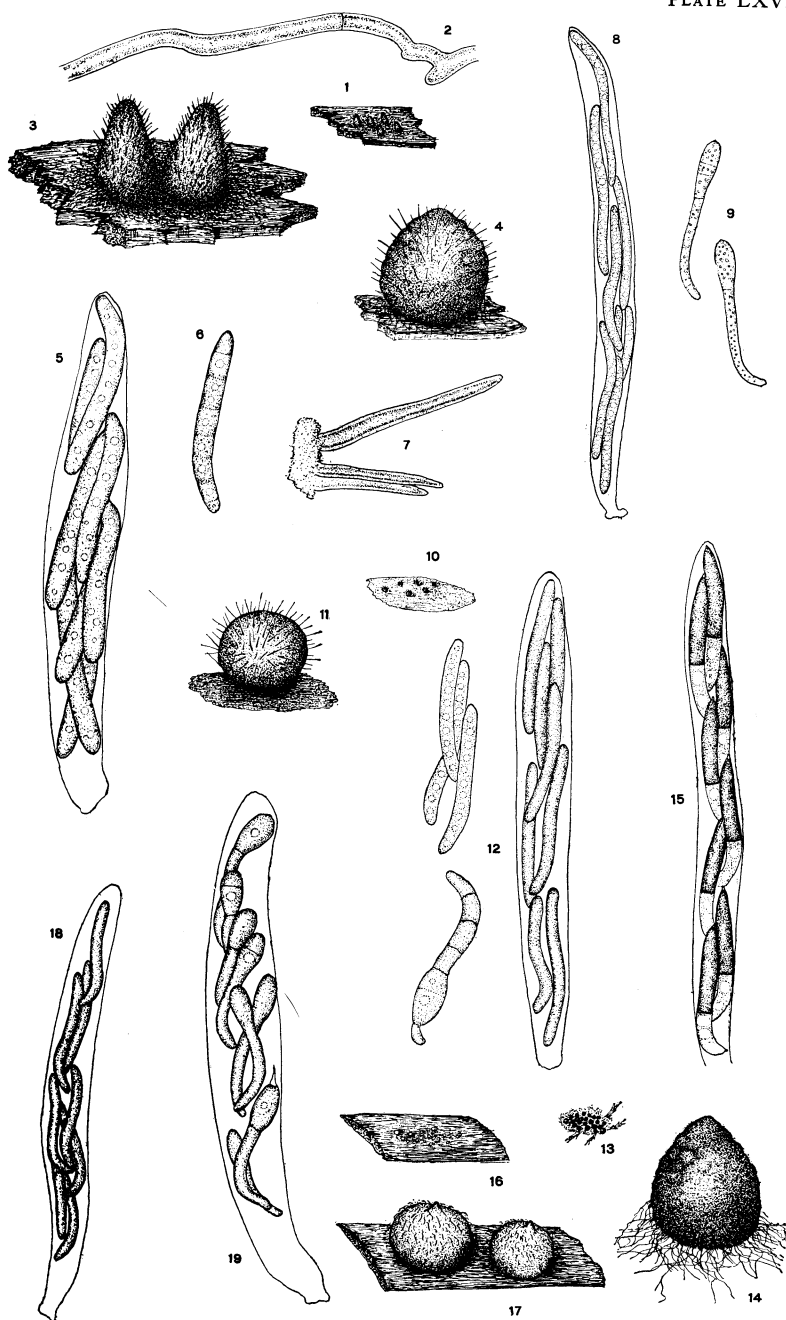
Figs. 8-9. *Lasiosphaeria multiseptata* Earle. 8. Ascus with spores. 9. Spores showing enlarged head.

Figs. 10-12. *Lasiosphaeria terrestris* (Sow.) deThüm. 10. Perithecia about natural size. 11. Perithecia enlarged. 12. Ascus with spores.

Figs. 13-15. *Lasiosphaeria dichroöspora* Ellis & Ev. 13. Perithecia about natural size. 14. Perithecia enlarged. 15. Ascus with spores.

Figs. 16-19. *Lasiosphaeria mucida* (Tode) Seaver. 16. Perithecia about natural size. 17. Perithecia enlarged. 18. Ascus with immature spores. 19. Ascus with spores showing enlarged heads.





LASIOSPHAERIA